

Weekly Report

10/20/2014-10/26/2014

Reserach

I fix a bug in my matlab code this week. Previously I set vector as zeros when there is no user data, e.g.,

$$X = \begin{bmatrix} 0.0046 & 0.0004 & 0 & 0.0092 \\ 0 & 0 & 0 & 0.0004 \\ 0.0022 & 0.0018 & 0 & 0 \\ 0 & 0 & 0 & 0.8694 \\ 0.0046 & 0.1159 & 0 & 0.1209 \\ 0.9886 & 0.8819 & 0 & 0 \end{bmatrix} \quad (1)$$

But there is an influence on solving the following optimization problem in this way:

$$A_{i*}^{t*} = \underset{A_{i*}}{\operatorname{argmin}} \frac{1}{T} \sum_{t=2}^T w^{t*}(t)(x_i^t - A_{i*}^{t*} x^{t-1})^2 + \lambda \|A_{i*}^{t*}\| \quad (2)$$

So I modify the equation above to eliminate the influence:

$$A_{i*}^{t*} = \underset{A_{i*}}{\operatorname{argmin}} \frac{1}{T} \sum_{t=2}^T f(t) w^{t*}(t)(x_i^t - A_{i*}^{t*} x^{t-1})^2 + \lambda \|A_{i*}^{t*}\| \quad (3)$$

where, $f(x) = \begin{cases} 1 & \text{otherwise} \\ 0 & X(:,t) \text{ is a zero vector} \end{cases}$

$f(t) = 0$ means that $X(:,t)$ is a zero vector, so $w^{t*}(t)(x_i^t - A_{i*}^{t*} x^{t-1})$ should not be added in. Consequently, the values of A change a little.

Plan for next week

- Read the sixth chapter of the book: Statistical Learning Method

Anew									
Anew <30x30x18 double>									
val(:, :, 4) =									
Columns 1 through 10									
0.3014	0	0	0	0	0	0	0	0	0
0	0.3167	0	0	0	0	0	0	0	0
0	0	0.1390	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0.0652	0	0.0416	0	0	0
0	0	0	0	0	0.0432	0	0	0	0
0	0	0	0	0.0235	0	0.0546	0	0	0
0.0038	0	0	0	0	0	0	0.0562	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0.1909
0	0	0	0	0	0	0	0	0	0
A									
A <30x30x18 double>									
val(:, :, 4) =									
Columns 1 through 10									
0.2234	0	0	0	0	0	0	0	0	0
0	0.2363	0	0	0	0	0	0	0	0
0	0	0.1092	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0.0557	0	0.0330	0	0	0
0	0	0	0	0	0.0352	0	0	0	0
0	0	0	0	0.0204	0	0.0430	0	0	0
0.0024	0	0	0	0	0	0	0.0456	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0.1391
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
Anew × A ×									